TMF

May 1990

THE MAC FLYER - For Greater Safety in MAC Air Operations

39TH SPECIAL OPERATIONS WING

The 39th SOW . . . page 16

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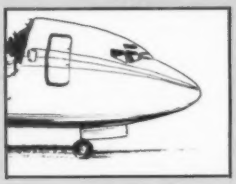

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Looking Back

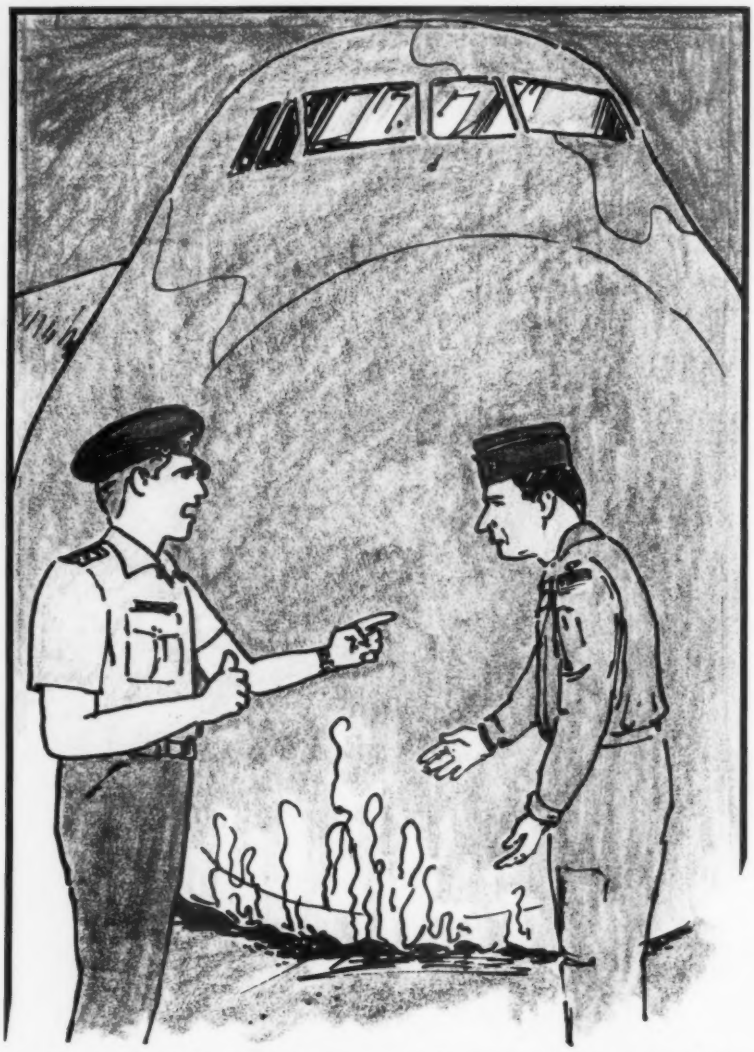
Are you afraid to ask or comment?

By Lt. Col. J. Norman Komich
102 ARRS, NY ANG

The day before I departed Vietnam, I decided to visit the operations officer and share with him a few points I had picked up during my tour with the 37 ARRS, flying HH-53 Jolly Green Giants. What I had to say was not something that needed Stan Eval attention, but rather some "nice to know" bits and pieces I wish someone had passed on to me when I first arrived in country, thus saving me from going through the trials and tribulations associated with learning them in combat. The operations officer was very happy with the information and assured me he would get the word out.

As I prepare to retire from the Air National Guard after 20-plus years of Air Force flying, I am once again motivated to share some of the bits of knowledge I've accrued during that time. The formal avenues available for sharing those years of experience are basically limited to just one on one encounters. I'm presently an aircraft commander in a unit with twenty-five year old aircraft commanders. Certainly, we hold the same relative position of authority but I would hope that in 22 years my attempts to grow as a pilot have proven somewhat successful and have provided me with that elusive concept of experience.

HONORABLE MENTION
1989 MAC FLIGHT SAFETY WRITING CONTEST



I am reminded of the plaque on the sergeant's desk which read, "SOME PEOPLE DO SOMETHING WRONG FOR YEARS AND CALL IT EXPERIENCE." I am also reminded of the description of one of the contributing factors to our poor performance in the Vietnam war: Due to the relatively quick turnover of personnel, the United States did not fight a 13-year war, rather, it fought a "one-year war 13 times." This philosophical point was made, no doubt, after observing a number of "reinventions of the wheel" by incoming personnel who were either improperly briefed by people they were replacing or who received no outbrief at all.

Anyone who writes personnel evaluations is aware of the significance of additional duties. Yet, how much guidance is ever provided in the conduct of these duties? Think of the tremendous guidelines available for the next person taking the job if people taxed with performing these duties were to consciously write a "job continuation folder" in which they described their daily, weekly, monthly, and annual duties. If the next person wrote his interpretation, one would eventually have a finely tuned, efficient approach to performing additional duties. There would also be a history of the evolution of this efficient approach so that change for the sake of change, rather than change for the sake of improvement, could be avoided. As Santayana observed, "He who fails to benefit from history is doomed to repeat it." If one is not aware of the history, however, how can he benefit from it?

This brings up the point of the article, which is the passing on of knowledge acquired through experience. Why is it relayed through war stories told at the bar or in "there I was" stories told to help pass the time on a 12-hour overwater leg? Lately, aviation safety magazines are providing an avenue for "Almost Happened" mishap stories and for that, editors should be commended. However, I believe the number of "unshared" experiences is far too large, thus limiting the ultimate capability of our Air Force.

I am always amazed at the depth of the investigation done AFTER the mishap occurs. Why isn't some of that "after the fact attention" applied before it happens? A classic example is a Navy squadron commander faced with his third major mishap. After the dust settled, he asked pilots to name the three worst pilots in the organization. Needless to say, such a poll lowered morale (already at rock bottom anyway), to an all-time low. When the same three names kept coming up, he took the three pilots aside and put the fear of God in them—no more mishaps occurred while he was in charge. The point is, there is an awful lot of knowledge out there but a lot of it is unavailable and/or unused. We in aviation need to work at improving our ability to tap into that veritable fountain of knowledge.

I can hear groans of disagreement from those who picture longer current checklists and additional checklists covering every conceivable contingency. They might also picture thicker regs, additional regs, and huge flight manuals. Although I don't advocate such a fate to those pilots who'll come after me, I wonder what can be done to bridge the gap between the 2d Lt. aircraft commander and the Lt. Col. aircraft commander. They both reference the same regs and Dash One, but the old head is carrying an encyclopedia under that bald dome. Why should the second lieutenant be denied that additional wealth of knowledge?

"Some people do something wrong for years and call it 'experience."

When I was a second lieutenant, my training officer told my flight at UPT, "There are three things the Air Force doesn't like: bad checks, gear-up landings, and taxi accidents." There are probably a lot more, but I must admit that during my 20 years, we have paid a significant amount of attention to the last two, but they are still occurring. Obviously, others still haven't gotten the word.

One the most frustrating periods of my flying career was the time frame during which I built the minimum time required in the aircraft before upgrading to aircraft commander. My peers at TAC told of soloing in their fighters after five flights, making a wing landing on the sixth, and shooting an approach to minimums on the seventh. I fumed as I logged month after month counting headsets and ordering crew meals, until I achieved that magical number. Suddenly I was thrust into the AC upgrade program. Now, as a commercial airline pilot, I see airline captains upgraded by means of a Phase III simulator. The first time they actually sit in an aircraft they have passengers on board! I think MAC's way is better, and I now wish I had taken advantage of long flights by picking the brain of the aircraft commander instead of listening to Voice of America or discussing where to eat on layovers.

Another frustrating facet of my career was the constant differentiation between procedure and technique. I'm aghast that early in my career some of my peers flunked their checkrides because they went below decision height during the missed approach on a precision approach. They were obviously victims of an overzealous examiner who didn't understand the difference between a procedure as a mandatory action and a technique as one of many approaches to accomplishing that action.

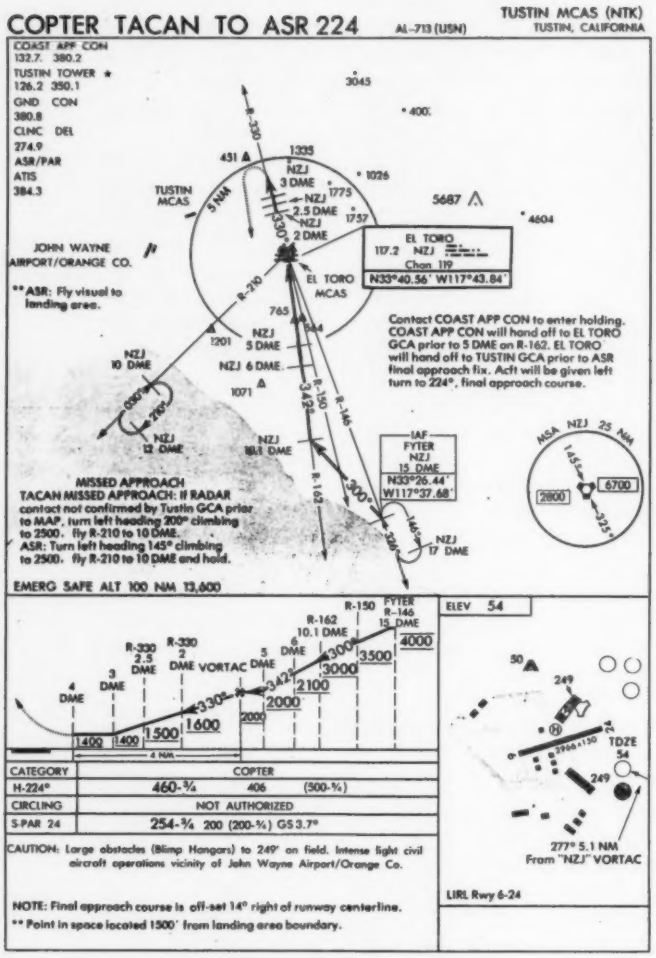
I vividly remember going through the "discussion" classes in my UPT, T-37 class. A few weeks after entering the next phase of the training program (contact, instrument, acro, formation, etc.), we spent a "down day" discussing the various techniques our instructors had taught us for completing procedures. This class made us acutely aware of other techniques available to accomplish any given procedure. That was the last time in my career that such a vast amount of knowledge was shared in my presence.

I have a number of opinions as to why there is such a reluctance to conduct such sessions. Perhaps people are afraid their techniques will be challenged by others. I should emphasize that such sessions should not be for *judging*, only *sharing*. Perhaps people feel some toes in Stan Eval will be stepped on. Perhaps people are afraid of being embarrassed. I also vividly remember one of my classmates in UPT who, when randomly quizzed, didn't know his bold face. I'm still amazed at the attitude he must have had to climb into that aircraft solo, counting on "It won't happen to me!"

Early in my career, I remember commenting to some old head that I had felt a lot more confident when I soloed the T-37 and T-38 than I did at that moment (approaching my initial aircraft commander upgrade ride). I acknowledged there was a heck of a lot more to learn, and he sagely replied that "upgrading to AC was nothing more than getting a license to begin to learn through experience." The whole point of this article is to say, "Yes, that was the case, but I take great exception to that approach, and I feel that through the sharing of experience, the learning curve for all pilots can be rapidly accelerated.

Lt. Col. J. Norman Komich, a fixed wing UPT 1968 graduate, flew C-133s, HH-53s, and UH-1s while on active duty. Colonel Komich flies H-34s and H-3s in the Guard and Reserve and is presently a pilot for a commercial carrier.

A "Copter Only" Approach


COPTER TACAN TO ASR 224
AL-713 (USN)
TUSTIN MCAS (NTK)
TUSTIN, CALIFORNIA
COAST APP CON
132.7. 380.2
TUSTIN TOWER ★
126.2 350.1
GND CON
380.8
CLNC DEL
274.9
ASR/PAR
ATIS
384.3
TUSTIN MCAS
5 NM
JOHN WAYNE AIRPORT/ORANGE CO.
**ASR: Fly visual to landing area.
EL TORO MCAS
EL TORO
117.2 NZJ
Chan. 119
N33°40.56' W117°43.84'
Contact COAST APP CON to enter holding. COAST APP CON will hand off to EL TORO GCA prior to 5 DME on R-162. EL TORO will hand off to TUSTIN GCA prior to ASR final approach fix. Acft will be given left turn to 224°, final approach course.
NZJ 10 DME
NZJ 12 DME
NZJ 5 DME
NZJ 6 DME
NZJ 10.1 DME
NZJ 17 DME
IAF FYTER NZJ 15 DME N33°26.44' W117°37.68'
MSA NZJ 25 NM
2800
6700
MISSED APPROACH
TACAN MISSED APPROACH: If RADAR contact not confirmed by Tustin GCA prior to MAP, turn left heading 200° climbing to 2500. Fly R-210 to 10 DME.
ASR: Turn left heading 145° climbing to 2500. Fly R-210 to 10 DME and hold.
EMERG SAFE ALT 100 NM 13,600
ELEV 54
CATEGORY COPTER
H-224° 460-¾ 406 (500-¾)
CIRCLING NOT AUTHORIZED
S-PAR 24 254-¾ 200 (200-¾) GS 3.7°
CAUTION: Large obstacles (Blimp Hangars) to 249' on field. Intense light civil aircraft operations vicinity of John Wayne Airport/Orange Co.
NOTE: Final approach course is off-set 14° right of runway centerline.
** Point in space located 1500' from landing area boundary.
277° 5.1 NM From "NZJ" VORTAC
TDZE 54
LIRL Rwy 6-24

Here at last, a *TMF* instrument quiz for helicopter pilots. Drag out your copy of AFM 51-37 (check the bottom of your pubs bag, it's in there somewhere).

1. What instruments provide direct and immediate indications of attitude or power changes?
   a. Control instruments.
   b. Performance instruments.
   c. Navigation instruments.
   d. Both a and b.
2. Changes in the indication of the altimeter and VVI are immediate when flying a helicopter.
   a. True.
   b. False.
3. The criteria for "copter only" approaches is based on the unique maneuvering capability of the helicopter at airspeeds not exceeding _____.
   a. 50 knots.
   b. 75 knots.
   c. 90 knots.
   d. 100 knots.
4. The altitude indication on the altimeter may be in error if the altimeter check is conducted with the rotor turning.
   a. True.
   b. False.
5. A helicopter flying any approach (except copter only) at 91 knots would be in which category?
   a. Category A.
   b. Category B.
   c. Category C.
   d. Category D.
6. To fly from FYTER to the NZJ R-162/10.1 DME

fix, you should:

a. Use lead points for turns to, and from, the DR legs so as to roll out on the depicted ground track.

b. Fly the course using the John Wayne VORTAC.

c. Attempt to fly the depicted ground track correcting for winds.

d. Both a and c.

7. The COPTER TACAN TO ASR 224 is an example of what type approach?

a. TACAN radial to an ASR.

b. TACAN radial.

c. "Point in space approach."

d. ASR approach.

8. What is the maximum distance from the landing pad which a "point in space" approach will place a helicopter?

a. 1,500 feet.

b. 2,000 feet.

c. 2,600 feet.

d. 3,000 feet.

9. How far from the landing area boundary will you be when you reach the ASR missed approach point?

a. 1,500 feet.

b. 2,000 feet.

c. 2,600 feet.

d. 3,000 feet.

10. A smog alert is in effect for Orange county. Visibility is ¾ statute miles. Tustin GCA cannot confirm radar contact as you reach the TACAN missed approach point. You should execute the:

a. ASR missed approach procedure.

b. TACAN missed approach procedure.

c. PAR missed approach procedure.

d. Follow missed approach instructions issued by GCA.

e. Either b or d.

11. El Toro GCA hands you off to Tustin GCA prior to the ASR final approach fix. To what heading should you expect a turn:

a. 224 degrees.

b. 277 degrees.

c. 240 degrees.

d. 210 degrees.

12. What is the highest spot elevation depicted?

a. 5,687 feet.

b. 4,604 feet.

c. 4,007 feet.

d. 6,700 feet.

13. What airfield will you cross at the final approach fix?

a. John Wayne Airport.

b. Tustin MCAS.

c. El Toro MCAS.

d. None.

ANSWERS

1. a. Control instruments provide direct and immediate indications of attitude or power changes. Power and attitude indicators are examples of control instruments. (AFM 51-37, para. 3-2e(1).)

2. b. Altimeters and VVIs are performance indicators. Changes in indications on performance indicators will lag slightly behind changes of attitude or power. This lag is due to inertia of the aircraft and the operating principles and mechanisms of the performance instruments. (AFM 51-37, para. 3-2e(2).)

3. c. 90 knots. "Copter only" approaches are based on the maneuvering capability of the helicopter at airspeeds not exceeding 90 knots. Based on this airspeed, "helicopter only" approaches may be used with the helicopter being considered an approach Category "A" aircraft. (AFM 51-37, para. 3-13a(1).)

4. a. True. The altitude indicated on the altimeter may be in error if the altimeter check is conducted with the rotor turning. This error is due to the difference in pressure caused by rotor downwash. The difference in pressure causes the altimeter to indicate lower than actual. (AFM 51-37, para. 3-14.)

5. b. Category B, speed 91 through 120 knots. When a helicopter is used to perform all other instrument approaches, TERPs protection criteria is based solely on approach airspeed of the aircraft. (AFM 51-37, para. 3-13b.)

6. d. Both a and c. The course from FYTER to the NZJ R-162/10.1 DME fix is a dead reckoning (DR) course. The DR course should be flown as closely as possible to the depicted ground track. (AFM 51-37, para. 12-5.)

7. c. Point in space approach. The published procedure shall be noted to this effect (** Point in space located 1,500 feet from landing area boundary) and also should identify the available landing areas in the vicinity by noting the course and distance from the MAP to each selected laning area. (AFM 55-9, TERPS.)

8. c. 2,600 feet. The point in space approach can place a helicopter up to 2,600 feet from the landing pad, and the pilot is expected to proceed visually, by ground reference, to the pad. If planning to use this type of approach, VMC conditions are required to maneuver. (AFM 51-37, para. 3-13a(4).)

9. a. 1,500 feet.

10. e. Either b or d. If you must execute an actual missed approach, follow the published missed approach procedure, or controller-directed missed approach instructions, and advise ATC that you are "missed approach." (AFM 51-37, para. 15-1f(2).)

11. a. 224 degrees. The final approach course is offset 14-degrees right of runway centerline.

12. b. 4,604 feet is the highest spot elevation; 5,687 feet is the highest obstacle.

13. c. El Toro MCAS is under the FAF. This approach procedure shares the same IAF as an approach for El Toro.

Single Engine Warriors

The mission goes on.

By Maj. Tom Farrier
HQ MAC/IGFF

A whirlwind tour of four SAC bases found MAC helicopter crews getting the job done safely in unkind climes. The plan was simple: Get to know what the 37th Air Rescue Squadron (ARS) does by visiting the four detachments still flying the single-engine UH-1H. It was hard to imagine how these units got by on a tenuous supply line, far displaced from their parent squadron, let alone their parent command. It's a given in the helicopter world that morale is high and camaraderie strong in the small organizations making up the bulk of Air Rescue Service. Still, the obvious question remains: how can crewmembers keep their spirits up flying around

the nation's frozen midsection, counting on one trusty Lycoming engine not to burp and deliver them into a long, cold wait for assistance? A quick look-see was in order.

First Stop: Detachment 9, 37 ARS.

The drive from Scott AFB, Illinois, to Whiteman AFB, Missouri, isn't particularly long, but the two bases are worlds apart in mission and level of activity. Whiteman, a SAC base without a primary flying mission for many years, is a beehive of activity. Facilities are being upgraded or newly constructed in anticipation of the first operational B-2 Stealth bombers' arrival. A tiny oasis of relative calm exists in the hangar housing Det 9 of the 37 ARS, which for years accounted for most of the active duty Air Force flying at Whiteman. Maj. (Lt. Col. Sel) Lee Meador, Commander, and Maj. Keith Curtis, Operations Officer, welcomed Lt. Col. Kent Lee, Chief of MAC's Flight Safety Division, in typical rescue fashion—trying to keep things running while just about everybody else was flying. Det 9's primary mission, like that of all but two of the 37's detachments, is to support its host SAC missile wing with time-critical airlift of people and parts. They also fly other support missions around their base's missile field. The Whiteman detachment is fortunate in this instance since the base itself is effectively surrounded by its launch facilities, rather than at the edge of them. This enables Det 9 to fly a large number of short-hop support flights while still having plenty of time available for rescue familiarization training.

Conducting a tour of the tiny operations area, Major Curtis pointed with noticeable pride to the briefing room, wallpapered with low-level hazard charts, airfield diagrams, and pictures of adversary weapon systems. "We spend a lot of time in there," he noted, adding that the scenarios for each simulated rescue mission are deliberately complex, and mission planning for them is time consuming. The Whiteman detachment's local flying area is well-suited to this type of training, containing plenty of challenges to low-level navigation.

The B-2 construction will affect the detachment too. They'll soon be moving from their present hangar to the other end of the flight line where a new helicopter operations facility is almost complete. It's a change that the pilots, whose desks are stacked into a single office, are more than ready to make.

Second Stop: Detachment 3, 37 ARS.

It seemed like a good idea to visit some of the northern tier bases when the mercury was down a bit . . . just to get a feel for the operating environment. Readers who have never experienced the sensation of having the hair in your nose freeze are encouraged not to seek it. Lieutenant Greg (Fotch) Falcinelli, the detachment's safety officer, served as the one-man Sunday afternoon reception committee at Grand Forks International Airport and pointed out the sights between the airport and the base. (It didn't take long!) Grand Forks is closest to the small town of Emerado, N.D., and is about ten miles from the city of Grand Forks itself. The base is run by a SAC air division, which hosts both a B-1B bomber wing and a Minuteman missile wing. Majors Mike Damron and Don Quinn, Detachment Commander and DO, respectively, are quick to point out the difficulty in supporting the Grand Forks missile field and the hazards encountered in doing so.

"Radio coverage isn't bad over most of the area," Major Quinn observed, "but the distances are pretty significant. Flying one aircraft from the base to the farthest site out and back can take up a good part of a day." Major Damron added that the detachment's traditionally low manning level and high mission workload kept the unit on its toes. They enjoy an excellent relationship with their missile wing "customers" and rarely have problems meeting their support taskings. The cold weather poses an ever-present danger—crewmembers carry arctic survival equipment on every sortie. A helicopter's great advantage in an emergency is the ability to make a quick landing almost anywhere, but a prolonged wait in an unheated helicopter in the middle of the Dakotas can be as dangerous as the emergency itself. Careful flight planning and flight following are the professional hallmarks of operations at Det 3, and they do them well.

Third Stop: Detachment 7, 37 ARS.

Same state, same weather—the government-issued parka is getting a real workout. At least most of the folks at world-famous Minot AFB are wearing theirs, too. With wind-chills down to -35 degrees F, there's no other way to go!

The guide for this leg, Lieutenant Ray Shultz, took a roundabout way into the base to show off a real surprise—a genuine UH-1F static display helicopter, proudly positioned near the VOQ. Minot denizens are accustomed to various jokes made about their base, but they close ranks to defend both the people and the sense of purpose you find there. Minot isn't a showcase for new weapons systems—the bomb wing flies B-52s and KC-135s, but everyone contributes to the base mission equally, and everyone is respected for the part they play in getting the job done. Where else could you find a "Chopper Avenue" on an

Air Force base?

Lt. Col. Denver Pletcher and Maj. Guy Dempsey, Detachment Commander and Ops Officer, show off their new operations and maintenance facility to all visitors. It shows obvious signs of extensive self-help improvements and upgrades. They were also the third consecutive supervisory team to praise their contract maintenance staff from Kay and Associates, Inc., (KAI).

Like their counterpart at all eight 37 ARS detachments, the Minot KAI staff works closely with their detachment's operators to meet SAC mission requirements, as well as MAC's continuation training needs. The KAI professionals, many of whom are retired Air Force maintenance specialists, brave the same conditions as the pilots on the flight line at Minot, usually for a lot longer time. During our conversation over several welcomed cups of coffee following the numbingly cold launch of a night training sortie, KAI personnel reminisced about some of the challenges they'd faced, including using a flatbed truck to retrieve a helicopter that had made a precautionary landing a considerable distance from the base. Detachment personnel, when they aren't otherwise engaged in flying, handling additional duties, hanging from helicopter skids in the O'Club, or applying stickers to everything in sight, have nothing but praise for KAI employees. They know those contractors "go the extra mile" for them sometimes, so they return the favor by sponsoring an annual "appreciation breakfast" every year. The sense of teamwork you find everywhere at Minot is epitomized by the esprit-de-corps of the two sides of Det 7—the flyers and the fixers.

Last Stop: Detachment 2, 37 ARS.

Well, it seemed like a good idea at the time. Why worry these hardy pioneers on the frontiers of MAC with a headquarters-type hanging around them for days on end? Keep moving, get around, don't wear out the welcome. Four dets in eight days may have been pushing it, though. The weather at Rapid City, S.D. was the worst of the week, with icy roads adding to the fun. A "nerveless" (and presumably unmarried and orphaned) driver from the motor pool made the trip to the edge of the Black Hills and Ellsworth AFB in a "Daytona qualifying time" (even for dry roads). The "Q" beckoned for the evening. First light saw record low temperatures—to the point that even locals were muttering as they stared at the weather channel (a popular diversion that entire week).

Ellsworth AFB is one of the busiest flying environments in the north central United States. The recently opened Strategic Warfare Center is headquartered there and plays host to a small crosssection of all of SAC's aircraft. The base also operates a full B-1 wing, a missile wing, one of the ubiquitous ACE (T-38) detachments and, of course, the Hueys of Det 2.

The commander and DO, Maj. Bobby Clegg and Maj. Rob Storey, along with safety officer Lt "Oz" Osarczuk, provided a thorough orientation. Density altitude (although about as low as the Lincoln Tunnel on this particular day) frequently becomes a factor in the detachment's support mission. Ellsworth is situated on the fringes of the Front Range of the Rocky Mountains, and much of its operating area incorporates higher elevations than the 37th's other single-engine Huey detachments. The terrain is far less forgiving, too. The plains of the eastern Dakotas and western Missouri give way to rolling, heavily wooded hills and ridgelines here, and fewer options for quick landing are available. A simple memorial plaque in the stairway leading up to Operations is a sobering reminder of the hazards that can stalk even the wary and prepared who fly in this environment.

The volume and diversity of air traffic around Ellsworth is a real challenge, as Major Storey is quick to point out. "Ever since the Strategic Warfare Center opened for business, use of the VR route north of the base has really been booming. Since the bombers are on one frequency and we're on another, the flying is VFR with emphasis on the 'visual'. . . heads up, looking out all the time."

Last fall, Ellsworth's Huey detachment hosted the 37th's first "Blade Wars," a comprehensive combat training exercise complete with threats and a continuously evolving intelligence scenario. Selected crews from all of the squadron's far-flung detachments converged on Ellsworth to participate in this first-of-its-kind event, which squadron officials hope to make a regular part of the "seasoning" of the many relatively inexperienced crewmembers who fly the missile support mission. The consensus among Det 2's pilots was that the sacrifices and hard work put into organizing this event were well worth the results.

The trip back to St Louis (by way of Minneapolis, the northern tier's answer to Atlanta), presented a good opportunity to review this whirlwind tour. It really came down to a few essentials:

—Some of Rescue's best flyers are making the most of a demanding, thankless mission with well-worn, but well-tended aircraft.

—The nature of our strategic deterrence posture and the geography of our missile base locations seems to guarantee they'll be needed for a long time.

—The best time to see the northern tier is not December!

Communication Is The Connection

Say what you mean . . . mean what you say.

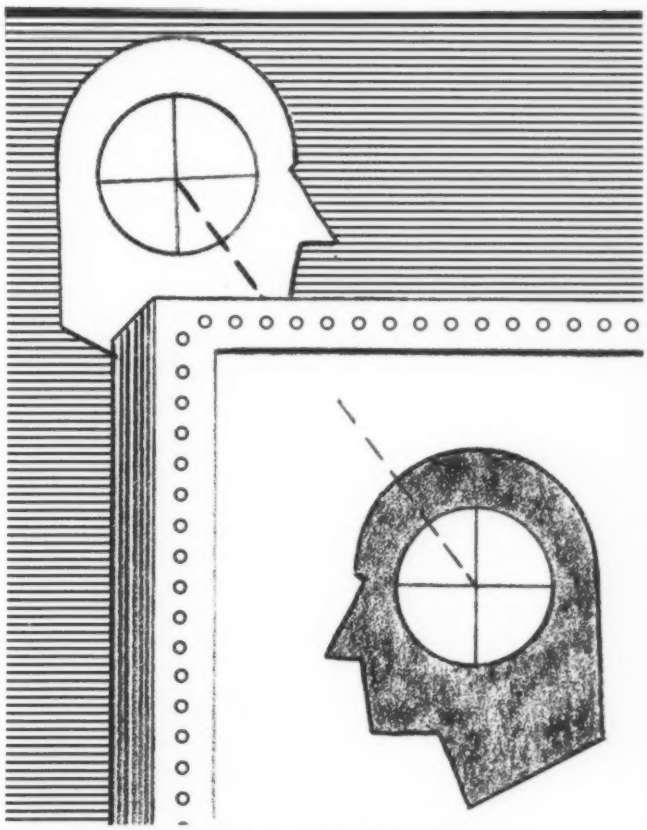
NASA's Aviation Safety Reporting System (ASRS) once reported an incident in which a student pilot, while practicing maneuvers with his instructor, apparently received a traffic report from ATC. The controller reported a potentially conflicting aircraft at 10 O'Clock. The instructor quickly spotted the traffic and informed his student, "I've got it." The busy student, interpreting this to mean his instructor was taking control of the aircraft, released the controls. Result: A stall warning and recovery of the aircraft by the surprised instructor.

How this incident affected these two aviators is known only to them. All we know for sure is that it impressed one of them enough to motivate him to record the experience for the benefit of other airmen. The incident is very useful in that it's a vivid example of what can happen when pilots fail to communicate.

The majority of accidents are the end result of a tragic accumulation of contributing factors. The mix is always different, but some combination of aircraft systems failure, distraction, outside pressure, complacency, fatigue, communication failure, physical problems, confusion, poor judgement or lack of proficiency is almost always present. It's usually apparent, when looking back on these catastrophes, that had the pilot or crew been able to interrupt the chain of events by recognizing and correcting just one of the failures, they might have been able to walk away from it safely. Pilot training, outside the major air carriers, has yet to emphasize, to a large enough extent, the importance of each of these potential failures. Knowledge and aircraft maneuvering skill continue on such a high level of priority that there is little time left to teach other important segments of knowledge.

COMMUNICATION IS THE CONNECTION

The pilots in this example got a scare from something unrelated to their ability to understand and handle their airplane. Hopefully, they were permanently impressed with the potential dangers of communication errors. They're not alone. About 80 percent of the reports given to NASA via the ASRS involve some kind of communication failure.



Communication is a powerful thing. It provides the connection between human minds working together to move the vehicle safely. It's also a process of effectively exchanging information by a common system of language, signs, or behavior. One of the frequent misunderstandings about communication is

that "commonness" is easy to come by. In fact, the use of communication methods not understood by both giver and receiver is one of the major obstacles to effective communication.

There are three fundamental requirements for communication to be effective. First, it must be received—both giver and receiver must understand there are potential barriers to this simple requirement. Second, it must be understood—this is where the failure occurred in the previous example. Finally, a communication is not effective unless it inspires the receiver to react. This may vary from using the information to verify one's own conclusions, to coming to a sudden understanding that an immediate change of plans is required. The receiver may only need to file the data for future reference, but at least he has used it. A communication resulting in anything less is not effective.

BARRIERS TO COMMUNICATION

Factors which work to block communication can be organized into three general categories. They are:

—physical

—psychosocial

—technique-related barriers.

Physical barriers primarily prevent a communication from being received. Problems in this category are fairly straightforward and easily identified and understood—things like noise, audible confusion, inappropriate volume, hearing loss, fatigue, and others. The first three are external influences which spring from the environment rather than from human limitations. Hearing loss and fatigue are more complicated in that they originate from within a person. If hearing loss creates difficulty in receiving communications, special care must be taken to employ available safeguards. The most important thing a pilot whose hearing is slipping can do, is to acknowledge it so he can correct it.

Fatigue is even easier to handle. A pilot who comes to his job without enough rest is unprofessional. When circumstances place a fatigued pilot at the controls, it is important to understand the possible effect and to act accordingly. Certainly the other crewmembers should know about it.

HIDDEN NATURE OF HUMAN ATTITUDES

Psychosocial barriers often block communication without making their presence known. Because they arise out of the complicated patchwork of human attitudes and feelings, their presence can be insidious and completely unrecognized. Moreover, if the feelings are strong enough, the relative importance of issues can be distorted to the point where a crewmember knows communication is blocked and simply does not care. This possibility makes this type of barrier uniquely dangerous. Some of the roadblocks falling into this category are resentment, preoccupation, status differentials, cultural differences, strongly-held differences of opinion, and so forth.

"A pilot must realize there is a notable difference between conversation and cockpit communication."

Resentment can arise from a number of different causes, and it may be justified, completely unreasonable, or anywhere in between. Resentment between crewmembers (or between pilots and controllers, pilots and mechanics, etc.) establishes a preconceived or predecided perspective in the mind of the resentful crewmember. Unfortunately, it creates the same frame of mind in the non-resentful pilot aware that he is resented. They assume the worst.

STATUS DIFFERENTIALS PLAY A ROLE

Psychosocial barriers can block communication at any level. Accident investigations reveal examples of crewmembers failing to even start communicating because of status differentials. Junior crewmembers have gone to their deaths because their fear of reprimand or loss-of-relationship with supervisors prevented them from asserting themselves enough to save their own lives. Conversely, some senior pilots have unnecessarily endangered their passengers because of fear of losing their subordinates' respect.

The possible human-interaction problems could easily fill a book. (As a matter of fact, they have; John Nance's book, *Blind Trust*, presents a thorough discussion of human interaction in the cockpit.) An aircraft commander does not receive a perfectly clear communication from his copilot because he is thinking about his angry exchange with operations just before the flight. The stereotyped perspective of the "Archie Bunker" in the right seat twists and distorts every communication with the minority pilot in the left seat. The avid hunter in the left seat discovers he is flying with an animal-rights activist. The belligerent nonsmoker in one seat grates at the puffing of the thoughtless smoker in the other. It can happen to almost any crew pair in a hundred unexpected ways. As long as the cockpit is crewed with people, effective communication will always be threatened.

What can be done about it? There are no pat answers. Practicing basic professionalism prevents

"loaded" communication. It is very important that communicators in the cockpit come to the process with a business-like frame of mind, put aside prejudgement-of-intent, and approach the process with the good of the operation in mind. The critical responsibility of flying the aircraft must completely eclipse any tension between crew members.

HOW TO PROCESS COMMUNICATION

When a pilot receives a communication in the cockpit, he must first realize he cannot control the tone or intent with which it was offered. That is the giver's problem. Like most cockpit problems, this can be handled with appropriate procedure. Once good communication procedure becomes habit, the potential for error is controlled.

A professional individual processes incoming data and information in the same way every time. The following questions should be answered about each operational communication received before a response is made or action taken:

—What is its literal meaning?

—What is its contextual meaning?

If these questions cannot be answered to the satisfaction of the receiver, he should seek clarification. Once this is done, he should move on to the next question; what action is appropriate in response to this communication? This controlled reaction establishes a professional atmosphere, regardless of the feelings between crewmembers and/or between crewmembers and outsiders. Professional communication does not involve implication of any sort. If exchanges are clear, precise, well-timed and procedural, a pilot never needs to ask, "What did he mean by that?" The question should simply never come up.

CHOOSING WORDS PROPERLY

Such issues as clarity, precision, and timing lead to the third type of barrier to communication. Besides physical and psychosocial, the most common category of communication barriers is the technique-related one. These are errors resulting from the undisciplined use of language.

The most common problem with communication technique is use of inappropriate semantics. This involves choice of words and construction of phrases. A pilot must realize there is a notable difference between conversation and cockpit communication.

Grammar is important. There are some "good old boys" who were great pilots, whose one aspect of excellence was their understanding between engaging in conversation and offering operational communications. Poor English and colorful idioms can open the door to misunderstandings—thus, barriers to communication.

People interested in communicating, who expect to be successful, must understand that the key element they provide, or control, is opportunity. This applies to both giver and receiver. It is the giver's responsibility to control language and timing, and the receiver's to maintain a physical readiness to receive information. This maximizes the opportunity for successful communication. Obviously, all crewmembers are at the same time potential givers and receivers of information. It should be remembered there are times when appropriate timing requires breaking through the other concerns of the receiver, forcing him to change the subject that is currently on his mind. A time-critical communication must be offered forcefully and verified that it was received.

THE ART OF LANGUAGE

Murphy has provided us with a law of language: Words and phrases will mean what they can mean. General, abstract or ambiguous words mean a lot of things. Precise, well-chosen words have specific meanings and, in accordance with Murphy's Law, will mean only that. It's fine to let your mouth stay a step or two ahead of your brain when you are shooting the breeze, but when it comes time to offer an operational communication to your colleague, a noticeable shift in emphasis is required. Communications must be planned so they are clear, precise, and specific, and in accordance with expected procedure.

Standard aviation terminology exists to ensure clarity and precision and to minimize the prospect of misunderstanding. When communicating with ATC, proper radio terminology should always be used. There is no reason to do otherwise. The importance of this is hammered into controllers constantly. Pilots should take it no less seriously.

A COMMUNICATIVE FRAME OF MIND

No matter which seat he occupies, a pilot requires a constant flow of information from the crew and from ATC in order to function. From the moment he shows up for work, the pilot seeks and receives critical information. An excellent pilot, among other things, maintains a readiness, even an eagerness to receive this input. To do that, he must struggle to understand and control resentment and prejudice. He must guard against noise, fatigue, and confusion, and he must be clear and precise. It may be the most difficult task facing him on a continuing basis.

Communication is one of the most subtle and dangerous complexities a pilot may face. Indeed, this could be the toughest system he has to master. But how much training do pilots get in interpersonal communication? Unfortunately, not enough.

Adapted From *Flight Safety Foundation*

Flying-Hour Milestones

10,000

22 MAS
CMSgt. Robert L. Lowdermilk

136 TAW
SMSgt. Otha E. Leach
MSgt. Donald W. Graves

728 MAS
CMSgt. John C. O'Donnell

7,500

7 MAS
SMSgt. Curtis J. Ocenasek

56 MAS
CMSgt. Benny L. Wigley

145 TAG
SMSgt. Horace M. Williams

302 TAW
Col. Jerry D. Boone
Lt. Col. David R. Frohman
Maj. Scott E. Wilson, III.
MSgt. Horrace J. Stewart

403 TAW
Brig. Gen. Joe L. Campbell
MSgt. Lee A. Snyder
TSgt. John A. Lestelle

440 TAW
Col. Norman Bowman
Lt. Col. Edward M. Duchnowski
MSgt. Joseph L. Gervasio
MSgt. Randall Reynolds

446 MAW
SMSgt. Robert E. Owen
SMSgt. Rusby S. Sides
MSgt. Norman C. Forney
MSgt. Michael T. Golden
MSgt. Bernd D. Keuhn
MSgt. Jarvis E. Owens
MSgt. David K. Trueblood

919 SOG
Col. Warren D. Snyder
Lt. Col. William H. Bosley
MSgt. Donald D. Beisel
MSgt. Donald C. Mazerat
MSgt. Richard A. Wall

5,000

7 MAS
Maj. Robert L. James
Capt. George F. Bruch
CMSgt. William A. Tkacs
CMSgt. Jack A. Kitterman
MSgt. David B. Bell
MSgt. Terry W. Stenz
MSgt. Rick L. Stills
TSgt. Lance A. Christopherson
TSgt. Hilario Flores
TSgt. Robert I. Jenkins
TSgt. Mark F. Ratigan
TSgt. Herbert N. Jones
SSgt. Thomas K. Stone
SSgt. Wayne Barrett

14 MAS
MSgt. John A. Smith
TSgt. Isaiah Allison
TSgt. John P. Mayser

22 AF
SMSgt. Gregory R. Jones

57 AES
SSgt. Butch O. Blake

57 MAS
Maj. David A. Davis
TSgt. Neil T. Tousignant
TSgt. John C. Matthews, Jr.
TSgt. Courtney H. Franklin
SSgt. Wayne A. Werling

62 TAS
TSgt. Johnathan L. Snider

67 SOS
MSgt. Ronald D. Hennion
MSgt. Richard W. Todd

75 MAS
CMSgt. Guillermo A. Hernandez
SMSgt. Elliott I. Davis

130 TAS
Lt. Col. Michael C. Farmer
Lt. Col. Herbert C. Wheeler

183 MAS
Lt. Col. Robert A. Cox
Maj. Robert E. Matthews

166 TAG
Maj. John C. Schneider

349 MAW
Lt. Col. Steven D. Bailey
SMSgt. Charles A. Carter

440 TAW
Lt. Col. John Elfers
Lt. Col. James R. Aversman
Maj. Monty A. Courteau
Maj. Wallace W. Farrus, Jr.
Maj. Vernon B. Jeremica
Maj. Dennis G. Kirby
Maj. Phillip A. Sanborn
Maj. Raymond E. Wallace

772 TAS
Maj. Ronald D. Munson
CMSgt. Allen D. Daugherty

773 TAS
Lt. Col. John Schriever
SMSgt. David Rae

301 MAS
Maj. Larry W. Bradford

312 MAS
Lt. Col. William F. Gallogly, Jr.
Maj. John W. Stoney

710 MAS
Maj. Eric H. Lenz
Maj. Michael A. Riehl

928 TAG
Maj. Donald J. Swaninger
MSgt. Jerry A. Pritt

2,500

3 MAS
Maj. Michael J. Quinn
Capt. Richard J. Burke
Capt. Joseph E. Fernandes
Capt. Mark S. Kirchof
TSgt. Walter E. Ramsey
SSgt. Bruce S. Kimball
SSgt. Jeffrey L. Kivett

11 AAS
Lt. Col. Norvin L. Davis
Capt. Mark F. Ebinger
Capt. Gregory L. Looker
Capt. Royce R. Schultz
Capt. James R. Vasatka

14 MAS
Lt. Col. Allan Swaim
Maj. James H. Simpson
Maj. Jay S. Steinmetz
1st. Lt. Jeffrey Wenberg
MSgt. Jesus Giron
TSgt. Michael A. England
SSgt. Joseph F. Colello
Sgt. Jeffrey A. Barmes
Sgt. Patrick G. McCarty

17 TAS
Lt. Col. Robert E. Winkler

20 SOS
Maj. Jeffrey W. Walls
MSgt. Benjamin J. Wilhelm, Jr.
SSgt. Jeffery R. Morrison

53 WRS
TSgt. Michael Boettcher

55 SOS
Capt. Robert E. Hawvermale
Capt. Michael W. Hodge
Capt. Michael V. Honsinger
Capt. Richard V. Kmiec
Capt. Kerry W. Taylor
Capt. Daniel E. Turney

56 MAS
Capt. Jerome F. Masonis
MSgt. Gus M. Holmberg

57 AES
Lt. Col. Linda E. McFarland
SSgt. Kenneth S. Dysinger

57 MAS
Capt. Thomas R. Kettler
Capt. John S. Crow
Capt. Todd F. Eherts
Capt. James R. Pavlisin
Capt. David E. Vincent
TSgt. John D. Williams

62 TAS
Capt. Paul A. Clay
Capt. James P. Plyler
Capt. Michael W. Woods

67 SOS
Lt. Col. Donald B. Bortner
Maj. Carl George
MSgt. Gary W. Teipel
SSgt. Karl A. C. Debacca
Sgt. Nick Banda

75 MAS
Lt. Col. Floyd M. Stall, Jr.
Capt. John E. Ball
Capt. Francis W. Dumbacher
Capt. Steven E. Hofmann
Capt. Marc S. Iogha
MSgt. Amost E. Dickson
TSgt. Armando M. Soto
SSgt. Peter R. Nelson
SSgt. Jonathon M. Gardner

76 MAS
Capt. James S. Greene

130 TAS
Maj. Thomas G. Wilson
SSgt. John S. Carr

167 TAG
Capt. Lawrence E. Yates
TSgt. Dennis R. Tusing

183 MAS
Capt. Robert S. Finch

185 TAS
Maj. Donald G. Barton
Maj. Randy D. Sadler
TSgt. Lyndol R. Harris

337 MAS
Capt. Jeff T. Hass
MSgt. Parker O. Garth
TSgt. James E. Mason, Jr.

440 TAW
Maj. Thomas Effenheim
Maj. Chuck Reddick
Maj. Richard Severson
Capt. Karl Dietmeyer
Capt. Peter Maynard
Capt. Mark Michel
Capt. Marc Schneider
Capt. Frank Spendley
Capt. Timothy Tarchick
Capt. Steven Wise
1st. Lt. Kevin Stokes
SSgt. Steven Bartz

Det 1, 616 MAG
Capt. Daniel D. Phillips

772 TAS
Lt. Col. Thomas M. Crawford
Capt. Jon A. Matz
MSgt. Robert J. Windhorst
SSgt. George Hrycan

773 TAS
Lt. Col. Bruce C. Balbin/CC
Maj. Joseph C. Campa
Capt. Christopher Francino
Capt. Joseph Uyehara

928 TAG
Capt. Richard E. Hanson
Capt. Vincent P. McCauley
Capt. Mark C. Schwing

Det 4, 1401 MAS
Lt. Col. Stephen J. Hritz
Lt. Col. Glenn R. Leimbach
Maj. John D. Barrowclough

Det 1, 1402 MAS
Capt. David A. Fillipini

1,000

20 SOS
Capt. Timothy D. Brown
Capt. Foster E. Gerhart
Capt. Frank S. Kersten
Capt. William T. LeMenager
Capt. Benjamin F. Pulsifer
Capt. Kenneth Sipperly
Capt. Rodney D. Tobias
Capt. Thomas J. Trank
Capt. Joseph Turnage, Jr.
MSgt. Patrick J. Cook
TSgt. Dean K. Chambless
TSgt. Thomas L. Mravak
TSgt. Michael R. Weber
SSgt. Charles H. Gutshall
SSgt. Melvin E. Sells
SSgt. Carlton N. Williams

55 SOS
Maj. Joseph E. Oscilia
Maj. David G. Winterrowd
Capt. Timothy C. Farver
Capt. Stephen R. Johnston
Capt. Eric A. Snadecki
Capt. Kenneth V. Volmert
SSgt. Gerald R. Diaz
SSgt. Richard A. Gomez
SSgt. Terry C. Hendrix
SSgt. Steven W. Kelley
SSgt. Joel Q. Parks
SSgt. Wade R. Reese
SSgt. Aubrey L. Wiley

67 SOS
Sgt. Robert J. Gdyk

Ranks and units are those at time of award.

39TH SPECIAL OPERA

Flying in Europe the Special Ops way.

MH-53 Pave Low

By Maj. Stephen Behr
Associate Editor

If it's Friday, this must be the 39th Special Operations Wing (SOW). The schedule for *TMF's* visit to MAC units in Europe was similar to a "seven countries in eight days" tour, packed with interviews, information, and new acronyms rather than tourist shops.

The 39 SOW is divided between two bases; the wing along with one squadron are tenants at Rhein-Main Air Base, Germany; the three other squadrons are tenants at RAF Woodbridge, United Kingdom.

The 39th activated as an Aerospace Rescue and Recovery Wing at Richards Gebauer AFB, Mo., in 1970, and was relocated to Eglin AFB, Fla., in 1971. On 1 March 1988, the wing was redesignated an Air Force Special Operations Wing, and on 8 May 1989 relocated to Rhein-Main Air Base, Germany.

The wing is the air component command for special operations within the European Command. Under operational control of the Commander, Special Operations Command Europe (COMSOCEUR), they plan and execute general war and contingency operations using advanced aircraft, tactics, and air refueling techniques to infiltrate, resupply, and exfiltrate Special Operations Forces. The 39 SOW reports to 23 AF for command lines. (For more on 23 AF, see the July 89 *TMF*.)

The 39 SOW has operational control over its four assigned squadrons. The 67th and 21st Special Operations Squadrons (SOS), and 667th Special Operations Maintenance Squadron (SOMS), are located at RAF Woodbridge, United Kingdom. The 7 SOS is located with the wing headquarters at Rhein-Main. Assigned wing aircraft include: MC-130E Combat Talon, MH-53J Pave Low, HC-130P/N Tanker, and a C-130E.

Crews of the 21 SOS fly the MH-53J, Pave Low helicopter. The MH-53J represents state of the art in helicopter technology. They are equipped with in-flight-refueling, terrain-following/avoidance radar, forward-looking infrared radar (FLIR), and inertial and doppler navigation systems. The navigation systems are integrated through an air data computer and provide unparalleled low-level terrain-following capability. The MH-53J helicopter is optimized to perform long-range, night, adverse weather, low-level penetration of hostile territory to accomplish infiltration and exfiltration of special operations land or amphibious forces.

The 67 SOS flies the HC-130 tanker. The HC-130 performs its primary mission as an airborne tanker for 21 SOS air-refuelable helicopters in England. It also assists those of 56 ARS at Keflavik, Iceland, by keeping one HC-130 there on rotation. Secondary roles include: airland, resupply, airdrop of special operations teams, and communications and navigational support for extended overwater helicopter operations. The 67th provides the legs to ensure 39 SOW special operations helicopter assets can meet wartime taskings.

The 667 SOMS is responsible for maintenance of the MH-53Js and HC-130s at RAF Woodbridge. In addition to home station maintenance functions, the unit currently provides TDY support to 56 ARS in Iceland and deploys maintenance teams during all exercises and contingency operations throughout the European theater.

Based at Rhein-Main, the 7 SOS flies the MC-130E Combat Talon. Their primary mission is the long-range infiltration, resupply, and exfiltration of special operations ground forces, Navy SEALS, and military units of both NATO and non-NATO nations. Peacetime training is conducted in an area encompassing all of western Europe, the Middle-East and Africa. The Combat Talon possesses the capability to support a broad range of unconventional warfare missions.

ATIONS WING

Maj. Jon Stolicny, Chief of Safety and TSgt. Bill Garner, Ground and Weapons Safetys.

The MC-130 is designed to operate in the low-level environment at night and in adverse weather, which greatly enhances the probability of an undetected penetration of hostile territory. Their tactics include airland, airdrop, and surface to air recovery procedures. Airlanding has proven the most reliable method of delivery or recovery. Using night vision goggles and precision airborne radar, approaches can be made into short fields either totally blacked out or to those defined only by infrared lighting. Airdrops can be conducted to drop zones identified by conventional visual markings or by a beacon placed on or near the DZ using onboard radar and navigational computers. As an alternate to airland, Combat Talon aircraft have the capability to extract personnel from an objective area using the Fulton surface to air recovery system. This system is a safe, rapid method of recovering one or two people, or up to 500 pounds of cargo from land or water, during day or night, in a single pass.

The wing's three operational squadrons provide special operations coverage for an area stretching from the north pole to the tip of Africa and from the mid-Atlantic in the west to the Urals in the east. That's a large geographic area with varied terrain.

To gain a better insight into the mission and its challenges, *TMF* visited Col. Byron R. Hooten, Commander of the 39th. He explained that "operating on a daily basis, particularly out of Frankfurt is a real challenge because of very dense airspace. The available low level routes and drop zones in Europe are limited and in Germany they are drying up. The political climate is such that it's more and more difficult to find training airspace.

"Another challenge we face is separation. The wing is separated now with squadrons at Woodbridge and one squadron and the wing here. Our operational boss is at Stutgart, Germany; our command boss is at Hurlburt Field, Fla. You can't spread it out much more than that. They aren't tough problems but they characterize our working environment.

"All our training is done somewhere else. Woodbridge does some local training and some of their work in England, but they have to go elsewhere with a customer for the majority of their training. When you're dealing with H-53s, you're dealing with a tanker that can refuel helos, normally the 67th. If the Talons require inflight refueling, then tanker support comes from outside the wing. Then we've got customers who aren't collocated. We have to pick up the SEALS at one location or the special forces guys at another to achieve realistic training.

"It's a very complicated environment. As we're doing exercises like JCETs (Joint Combined Exercise Training), the coordination effort is monumental since we are always dealing with another country. Even small exercises can easily involve two or three countries before it's all over. All diplomatic requirements must be considered. Most airfields we go to are PPR, so something as small as clearances on an extended exercise comprise a pretty good volume of work. Since most of our training is conducted in a number of countries in Europe and Africa, coordination is required for things as simple as drinking water. Our exercises often carry NATO and non-NATO special forces folks which adds to the planning requirements. There are also added unknowns when we deal with various elite forces—cultural and language differences are most obvious. Fortunately, the folks working these exercises have a lot of experience in special ops and they really understand the environment. That makes it simpler."

Exercise participation helps the 39th expand and improve its rapid deployment and combat capabilities. The wing participates in four levels of exercise training. JCS exercises, such as Flintlock, provide the wing with the ability to test large mobilization capabilities and maintain operations in deployed locations. Joint Special Operations Command (JSOC) exercises provide realistic scenarios with participation of both U.S. and foreign

elite ground forces. Joint Combined Exercise Training (JCET) exercises are the basis for the majority of aircrew training. These exercises are coordinated by the squadrons. They last from one day up to three weeks and let squadron folks interface with special and conventional forces of other NATO and non-NATO nations. Joint Special Operations Training (JSOT) exercises are one or two-day events which deal mainly with U.S. Army Special Forces and U.S. Navy SEAL teams in the theater. JSOTs are coordinated by the squadrons and are extremely flexible in terms of coordination and planning. Exercise participation provides wing aircrews, supervisory staff, maintenance, communications, and intelligence folks with a realistic environment to test command and control and weapons systems employment, while gaining experience in different theaters of operation.

At Rhein-Main, *TMF* visited with the commander of 7 SOS, Lt. Col. George C. Ferkes. He began by relating, "The real challenge in Europe right now, other than the normal ones we're used to, such as weather, working within a lot of different ATC structures, and short distances to borders, is the political sensitivity to low flying—and low flying is our business. A real challenge is finding areas in which to train that meet the criteria of local governments—all the way down to village mayors—and still make training missions challenging enough so our people stay combat ready. This challenges the aircrews to really intensify their mission planning.

"For a local mission, the navigators and aircraft commander spend around three hours pre-planning the day prior to flying a four-to six-hour mission with multiple events. This forces aircrews to plan in detail for each segment of the event and have multiple backup plans. Weather, changing requirements at the destination airfields, maintenance delays, etc., are things you could easily adjust to when you own the training airspace and airfield. When you only have access to an airfield for an hour and a half, and your mission is delayed or you get there on time and find out their fighters are being recovered early—you've lost the training you had planned.

"For special operators in Europe, especially the 7th, the challenge is to figure out, on a local training line, how to achieve the maximum training in a period of decreasing flying hours while increasing the Talon crew force. The JCET program operating through EUCOM, allows us to go to other NATO countries and other allies for combined training with them and use the airspace and airfields of the participating nation. It gives us the opportunity to practice our mission and use our equipment to the maximum extent possible—that's getting down to 250 feet AGL, at night, in mountains and in the weather in some areas.

"In the 7th we have our own maintenance folks. Their challenge is to keep the airplanes going and in a mission-ready status. To keep the planes repaired on the road, we take a maintenance team on every deployment. We are fortunate in that we have very good folks in maintenance; they are dedicated and have a very strong mission identification because they are part of 7 SOS. They identify with the 7th; they wear the patch and go TDY with the 7th. The 7th is not just an ops squadron. It's a real challenge to make it all work."

To discover the crewmember side of special ops flying in Europe, *TMF* visited Maj. Butch Gilbert, Chief of Standardization for the 39th. He began by saying, "Crew coordination is absolutely critical when flying terrain following (TF) at 250 feet; that's the standard we train to in Talons. The 67th's HC-130s fly a constant 500-foot AGL altitude and MH-53s fly TF at 100 feet AGL into threat areas. It's challenging at night and in IMC, to make a specific TOT in mountainous terrain. You have to know where you are going, figure out if where you're going is safe or not, and know how to recover in each country if the weather begins to go down.

"When we're out flying low level during day VFR, it's strictly a 'see-and-avoid' environment. At night, we deconflict with the fighters based on altitude; they fly the night link routes at 1,000 feet AGL while we're down at 500 feet AGL. If the weather goes down, there are emergency procedures in the Low Fly Handbook for Europe, but you may be climbing into a fighter route. Crews have to be aware of their position in relation to fighter routes. Situational awareness is the key to successful mission accomplishment.

"Flying on NVGs is a large part of our mission; the 67th conducts air refueling while wearing them, and the 7th airlands and hot refuels helos on NVGs. Surprisingly, NVG flying in Germany is easier than in some countries. In Germany, we can locate a DZ based on lights of surrounding villages and knowing our location in relation to a DZ. During a Flintlock mission, the town we were using to help find the DZ wasn't lit at night, which made locating the DZ a little more difficult. Each country has its own quirks which take time to adjust to. Small villages outside Germany may not have street lights on all night. It's something you don't expect when you first night fly' here."

The future looks bright for the folks of the 39th. Tough training and dedicated professionals ensure the 39 SOW stands ready to meet its real world commitments.

All I Could See Was Blue Sky

By Jan W. Steenblik

On 28 April 1988, at 1:24 PM., Aloha Airlines Flight 243, Boeing 737-200 service to Honolulu, blocked out. The 45-minute trip was the third flight of the day for First Officer Madeline "Mimi" Tompkins, the ninth for Captain Rob Schornstheimer, and the last flight of the day for both. The skies were clear.

"Everything was routine," Schornstheimer recalled, "right up until the 'event.' Mimi was flying the airplane. All of a sudden we heard a really loud noise, sort of a thoomp . . ."

"We'd passed through 23,900 feet," Tompkins remembered. "I was just starting to push the yoke forward to level off."

"One second, everything was normal; then, in a split second, debris was flying all over the cockpit," added Schornstheimer. "It was totally unreal. I looked back at the cabin, because a lot of the noise and debris was coming from that direction. The cockpit door was completely gone. In the cabin, everything above shoulder level was gone—all I could see was blue sky. We immediately started our drills for rapid decompression, putting on our oxygen masks, deploying the passengers' masks, and beginning our descent."

The noise was so deafening, the two pilots had to communicate with hand signals. "I don't recall even trying to shout," said Schornstheimer.

"When Bob took the plane," Tompkins continued, "I reached for my oxygen mask. It wasn't there, it had been blown away. As I reeled it in by its hose, I glanced back for a second at the first-class passengers. I didn't notice that the ceiling was gone, but I could see the left side of the fuselage was missing."

In the jump seat was an air traffic controller. "I remember seeing him put his mask on and thinking, I don't have to worry about him," Schornstheimer related.

The Captain's first task was to get to a lower altitude quickly, but not too quickly. "I don't remember the rate at which we descended," Schornstheimer admitted. "The airplane was rolling and shaking. I didn't want to go any faster than (the speed) this happened at, so I deployed the speed brakes. Maui," said Schornstheimer, "was the nearest suitable airport. It was clearly the only place we could go."

Communication with air traffic control, however, was another matter. "I tried calling Honolulu center," Tompkins explained, "I remember transmitting twice, trying to tell them we were descending. I was having trouble with the radio and couldn't hear any reply. I decided to call Maui Tower directly.

"I said we were out of 13 (thousand feet), east of Lanai, with an emergency, requesting immediate landing, with the equipment. Meanwhile, we were slowing our descent through 10, and Bob started planning the approach."

"Actually," said Schornstheimer, "we never leveled off. We were slowing down, getting ready for controllability checks. We were flying a higher profile than usual to conserve altitude, making real shallow turns, with maybe a ten-mile radius. Somewhere in there, we realized the left engine was out."

"I remember pointing it out to you, and you acknowledging it," Tompkins responded. "But," she added "you were busy."

"We tried to start the left engine," Schornstheimer continued, "with no luck. We started the APU to provide some of the electrical power on the airplane. We started controllability checks about 20 miles south of Maui, first flying one degree of flaps and 190 knots."

Schornstheimer added: "I remember at one point, I think it was when I went from flaps 5 to flaps 15, the airplane started bucking and shaking a lot more, and the controls were getting stiff again. I remember looking at the mountains on Maui in the distance and thinking that this could be it. But that only lasted for a moment, and then I went back to

flying the airplane. I determined that 170 knots at flaps 5 was the slowest speed we could fly and retain controllability."

At this "slow" speed, the two pilots could shout and make themselves heard. Their conversation, however, proceeded from one emergency procedure to another.

"We tried to slow below 170 knots to Vref speed for flaps 5 landing, which I asked Mimi to look up in the asymmetrical flaps checklist," Schornstheimer recalled. "But control again became squirrelly. When we put the gear down, we got green lights on the mains, but the nosewheel light didn't come on. I told Mimi to go to the alternate gear extension procedure."

Still no green light.

"I told her to put the gear handle in the 'off' position and try again," Schornstheimer continued. "She did, tried again, and still no green light. I told her to put (the handle) down again and tell the tower that we had no nosegear indication, but that we were going to land anyway. In our condition, we were not going to make a tower flyby."

Schornstheimer had kept the aircraft on a steep initial approach path to Kahului Airport's Runway 2. "We had a lot of altitude to lose. I was confident we'd make the airport." A couple of miles from the threshold, he flattened the approach and brought the power up.

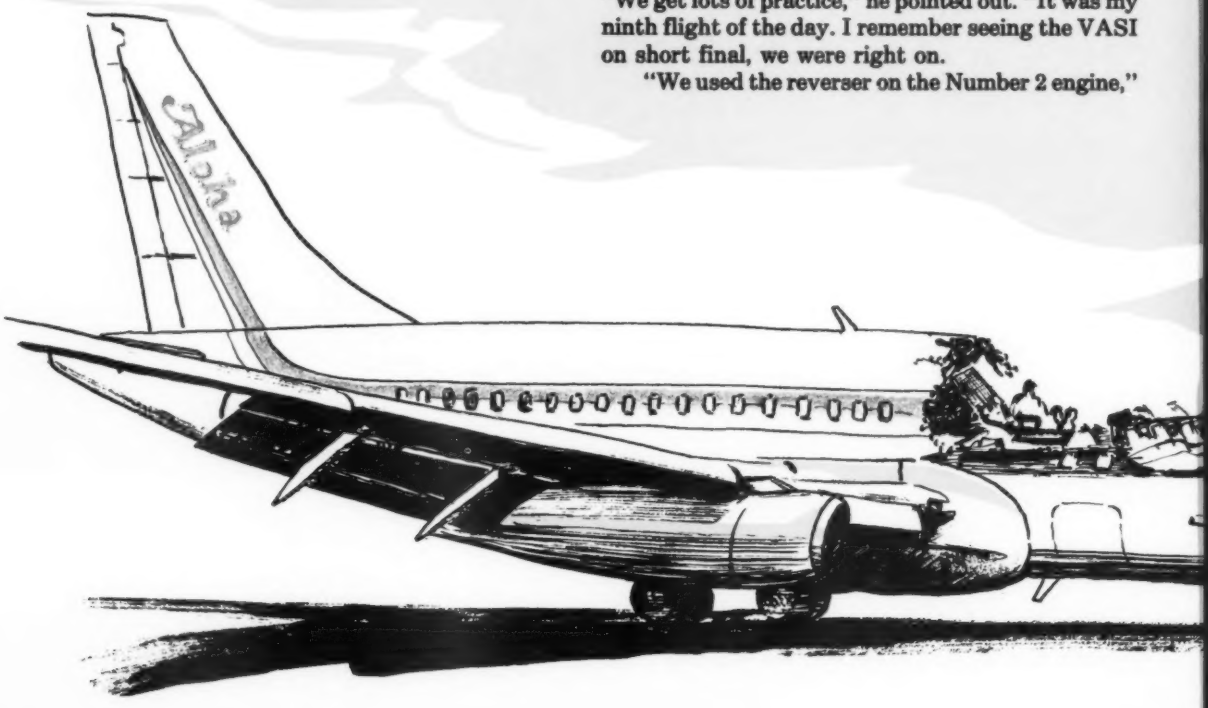
"Inside two miles," he said, "I remember seeing 1.9 EPR on the good engine. That's a pretty high power setting—there's not much left after that. The tower put the glasses on the nosegear and said it appeared down and locked. At this point, we'd already had a structural failure, rapid decompression, an emergency descent, an attempted in-flight engine start, an alternate gear extension procedure, stiff flight controls that felt like a manual reversion, a need to look up a bug speed for a flaps 5 landing, and a single-engine approach. I was going to put it on the runway."

Observers at the airport watched as the badly damaged airplane, still shedding pieces as it flew, descended toward the pavement.

"Bob made a great landing," said Tompkins. "We touched down in the normal position and stopped in the normal position."

Schornstheimer played down the achievement. "We get lots of practice," he pointed out. "It was my ninth flight of the day. I remember seeing the VASI on short final, we were right on.

"We used the reverser on the Number 2 engine,"



Schornstheimer continued. "After we stopped, Tower told us to leave the aircraft right there. That was my intention.

"I remember Mimi telling the ACM to get out. Then we went through the emergency evacuation procedure. We'd fired the bottles. We went back and helped get the passengers off the aircraft."

After Tompkins and Schornstheimer climbed out of the cockpit, "both of us just stood there for a moment," she recalled.

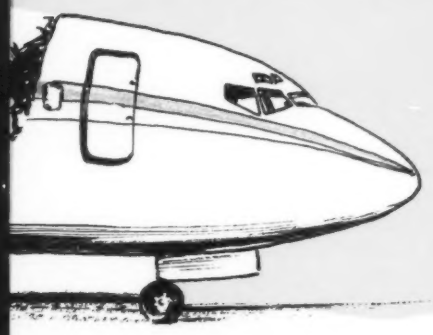
"Big pieces of floor were poking up in the aisle," Schornstheimer recounted. "I could see the cables to the flight controls underneath and some of them were loose. I tried to pull the pieces of floor out of the way so the passengers could get to the exits more easily. The next thing I remember is people on the ground yelling for rescue people."

Tompkins recalled the eeriness of the first several minutes after landing. "I don't remember hearing anything. I think maybe our ears were numb from the noise.

"It was all very calm. It was obvious there was no fire. Some people were taking things down from the overhead. The injured people were just sitting in their seats, not moving. I remember two guys shook my hand, said something to me, I don't remember what. Everyone looked very stunned, in shock.

"The people who had been sitting against the wall all had a line across their faces. On the side near the wall, their faces were red. I heard later that their blood vessels had burst under the skin. All the blood from wounds was dry; it must have been from the wind.

"A few of the injured were conscious. I was calling for medics. A guy and girl who had just got off turned around and said, in unison, 'I'm a nurse!' They came back onto the airplane to determine which passengers needed immediate assistance."



A few minutes after landing, Schornstheimer noticed "a loud noise, sort of like a blowtorch, coming from the vicinity of the left engine. I went back to look into the front and back of the engine to check for fire. I noticed the left outboard tire was slowly deflating. I figured the sound was coming from the fuse plug letting hot air out of the tire.

"As I was walking over to the east side of the runway, looking for our injured flight attendant, Jame Sato-Tomita," said Schornstheimer, "a whole bunch of people came over and started shaking my hand, saying things like, 'Thank you for getting us down in one piece, we're lucky to be alive, we can't thank you enough;' things like that."

The pilots made only a brief walkaround to inspect the damage to the airplane; a few days later, they spent a full hour with accident investigators examining the damaged airframe.

During their first look at the airplane, Schornstheimer noticed "some big pieces of metal wrapped across the intake on the right engine, the good engine. The engine had bent blades, and there was metal embedded in the engine cowl."

Tompkins added, "I saw a big piece of fuselage lodged in the leading edge where it meets the engine pylon. Later, I saw a piece missing out of the leading edge of the stabilizer. There were a lot of dents and holes."

Asked if the pilots had the opportunity to think about their brush with death, Schornstheimer replied. "We were very busy trying to help the passengers and everything. Before we left the site, we gave the authorities a position report, where we think we were when the structural failure occurred and let them know that C. B. was missing."

Schornstheimer admitted, "For the first few days, my sleeping patterns were sort of messed up. I kept going over and over those 13 minutes in my head, an involuntary action."

Tompkins has relived the experience the same way, reporting, "It was hard to think about anything else."

One of Schornstheimer's decisions to err on the side of caution may have saved several passengers' lives. "I don't remember turning off the seat belt sign," he said. "Normally, I consider it when passing through 10,000 feet. Earlier, there had been some reports of turbulence over Molokai. Sometimes the winds blowing past Haleakala Crater on Maui create some turbulence. Based on my experience, it's one

of those things where in doubt, I leave the seat belt sign on."

Schornstheimer, who had 7,000 hours in his logbook at the time of the accident, was a T-38 flight instructor in the U.S. Air Force prior to his 11 years of service with Aloha. Tompkins, with more than 9,500 hours, became the airline's first woman pilot after building time and experience through a long chain of general aviation piloting jobs.

"Mimi was scheduled to start captain upgrade school yesterday. She'll be our first woman captain at Aloha," Schornstheimer pointed out. With Tompkins being one of the airline's senior first officers, and Schornstheimer a relatively junior captain, they'd only flown together "maybe two or three times," he said.

Tompkins emphasized that "the training we receive as airline pilots really stressed crew coordination. In the flight simulator, they give us multiple emergencies. It had been stressed to us to prioritize what needs to be done to work together as a team."

Schornstheimer added, "I think I would be concerned if we got any less training than we do. Our airline has been very good about maintaining the same amount of training since deregulation.

"I think we're representative of pilots at a stable airline that's been around for a while," said Schornstheimer. "We're pretty experienced and seasoned. I'm sure our high time in the '737 helped, but I think other pilots would have done the same thing."

ALPA President, Capt. Henry Duffy has stated: "Those of us who have chosen airline piloting as a profession learn and grow and gain experience in anticipation of a moment—the moment—when all we've learned and all we are is laid on the line.

"The moment doesn't come for everyone," Duffy added. "The professional confidence of an airline pilot comes not from assuming that the moment probably won't come, but rather in knowing that it will come, and that we will be ready and able to meet that challenge. In anticipation of the moment, pilots squeeze from the routine challenges of their daily operations all the knowledge and experience they can. In the cockpit, familiarity breeds extraordinary strength.

"When the moment comes, during the first hour of a duty period when we're fresh and alert or during the last hour when the day's flying has taken its toll, the pilot must have faith that he will be able to transcend familiar proficiency and pull from that reserve of strength untested levels of expertise and precision.

"That is what a professional pilot is. That self-knowledge has served our profession well over the years, as it has served the passengers who entrust their lives on us.

"I would like to honor a crew whose response to a perilous challenge is a living testimonial to the ideal of a pilot's ability under extraordinary circumstances. To anyone who feels that pilots are underworked and overpaid, perhaps you should ask the passengers on this flight how they feel about the worth of a professional pilot."

Duffy has presented ALPA's Superior Airmanship Award to Schornstheimer and Tompkins, "whose courageous professionalism and extraordinary skills as aviators were demonstrated when an explosive decompression crippled their aircraft. Despite the fact that their aircraft suffered a separation of a substantial portion of the fuselage, buckling of the body frame and floor structure, impact damage to the wings and tail surfaces, and the irreversible loss of one engine and damage to the other, pilots Schornstheimer and Tompkins nonetheless avoided a potential disaster and saved the lives of 94 passengers and crewmembers by nursing and wrestling their disabled aircraft safely home."

Schornstheimer said he was accepting the award "as a representative of all professional airline pilots, whose daily toil often goes unappreciated.

"Our training and experience allowed Mimi and me to handle the emergency," he noted. He praised the flight attendants and the passengers for their courage, plus "Mimi's calm, professional assistance." Schornstheimer concluded, "I am extremely grateful to be here to accept this award."

Tompkins credited "the high standards of our profession," and joked that "at least for once, the Captain was always right." She said she learned from the 13-minute ordeal of Aloha Flight 243 that "training by itself isn't enough," and "when we combine good training and crew coordination, we can handle any crisis thrown our way."

The application to the way we do business in MAC is obvious. The terms "crew coordination, cockpit management, and professionalism" are viable concepts. As crewmembers, we daily face the challenges of tight schedules, bad weather, etc. It is through training and effective crew coordination, just as with the pilots of Aloha Flight 243, that we successfully overcome adversity when our world starts to fall apart. ✈

Adapted from *'Retrospect'*, Quantas Airlines.

Excellence in Airmanship

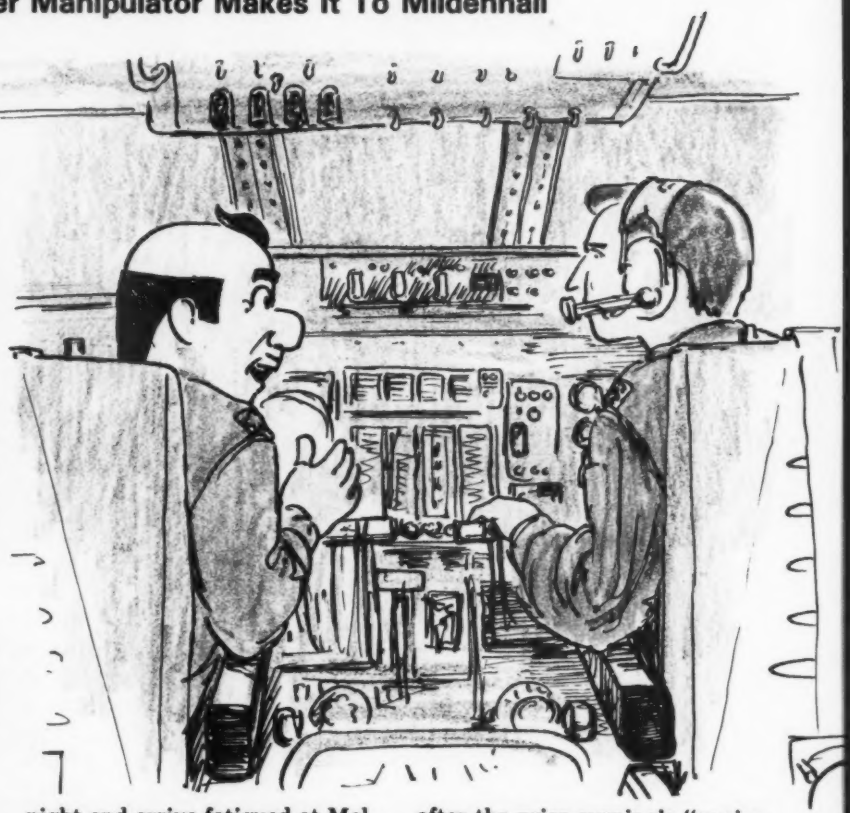
Capt. George F. Jones

1st Lt. Brady C. Cheek

Capt. George E. Jones and 1st Lt. Brady C. Cheek, Det 1, 1401 MAS, Offutt AFB, Nebr., were 11 ½ hours into their crew day when they departed an en route stop with seven passengers on board. Shortly after Lieutenant Cheek's takeoff, the C-21's cabin and cockpit were engulfed in smoke and fumes, (later investigation revealed the cabin blower motor had burned up). While Lieutenant Cheek maintained control of the aircraft, Captain Jones ran the "Cabin/Cockpit Fire, Smoke, Fumes" checklist. The crew donned their oxygen masks, dropped the passenger oxygen masks, and declared an emergency. Smoke and fumes continued to pour into the aircraft, aggravating the already reduced visibility caused by nightfall. Smoke was so intense that all the passengers were not visible from the cockpit. Despite the darkness, high altitude, heavyweight takeoff, and disorientating restricted visibility, Lieutenant Cheek continued to control the aircraft while Captain Jones tried to clear the cabin of smoke, isolate the malfunctioning system, and coordinate with ATC. Because of the existing emergency conditions, the crew had only one opportunity to do things right. Captain Jones decided to have Departure Control vector the aircraft around for a short ILS to Runway 32. That decision allowed him time needed to clear the smoke and fumes and run all appropriate checklists. On short final, Captain Jones assumed control of the aircraft and landed uneventfully. He cleared the active runway and shut down the aircraft while Lieutenant Cheek calmly evacuated the passengers. Total time from takeoff to aircraft evacuation was seven minutes. Captain Jones's and Lieutenant Cheek's quick and professional actions during this critical situation prevented possible loss of lives and aircraft. Their actions deserve the Excellence in Airmanship Award. Congratulations from *TMF*.

C.R. TERROR

The Master Manipulator Makes It To Mildenhall



"Sammy, you look a little frosty in that leather flight jacket," proclaimed the Able Aeronaut. "My custom-tailored nomex winter flight jacket with its fur-lined hood, is just the thing for this climate."

"Boss, our mission wasn't scheduled to RON until we got to Mildenhall; this jacket will be fine when we get to Jolly Old England," replied Long Sufferin' Sam. "Keflavik wasn't part of our itinerary."

"Well, Samuel m'boy, I'm sure the able ALCE maintenance folks have un-faulted our recalcitrant generator and CSD. Soon we'll be winging our way to the great U.K."

"Major Terror," began MSgt. Max Torque, "the maintenance folks couldn't fix the differential fault, so they removed the generator. It's in the cargo compartment. Moldyhole maintenance has a new one waitin' for us."

"No problem m'lads. The Lifter's remaining three generators are more than sufficient to provide our electrical power requirements.

"Diverting in here was a great idea. We didn't have to fly all night and arrive fatigued at Moldyhole. We'll arrive there in time for lunch at Mickey's Tea Room, then we'll be off to seek a source for E-type Jags. I have it on good authority there's one only a few miles from the base."

The Dynamic Duo and Sergeant Torque, got the Starlifter's fans turning and burning with only slight checklist deviations by the Magic Major. Sam and Max were beginning to think the flight to Mildenhall would be uneventful after the prior evening's "engine out" maneuvers.

As they approached the runway, Tower cleared them for "an immediate takeoff." Not wishing to incur the rath of ATC and fearful of another late departure, C.R. was more than willing to comply. As the Magnificent Major jammed the throttles full forward, Sammy barely managed to keep the TF-33s from exceeding the manufacturer's recommended operating limits. About the same

time Max was completing the lineup check and Sammy called "Rotate," the Number 1 "generator out" light came on.

"Boss, engineer. Number 1 generator's inop. We're down to two working generators."

"Have no fear. The odds of another failure are astronomically high. Gear-up, Samuel m'boy," ordered the Ace of Aerospace. "Autopilot engaged. Proceeding direct to Vestermester."

"Boss, engineer. I've tried all the Dash One procedures and techniques, none are working. I don't think we can depend on a 'Lockheed fix' to recover Number 1 generator. I think we need to turn back to Kef."

"Turn back? Nonsense! It's a mere two-and-a-half hour flight time to Moldyhole, home for some of MAC's finest en route maintenance magicians, not to mention a happy hunting ground for the great Jaguar safari. Besides, I can't stand to see Sammy sufferin' in the arctic cold."

"Don't worry about me being cold," replied Long Sufferin' Sam. "Should we review the Dash One, so we can lessen the electrical load if need be?"

"Egads! All this doom and gloom is making me hungry. Sergeant Downs, would you bring up my PB and J box lunch?"

"Sure chief, but you may be disappointed. These lunches can't compare to the ones from the Packer In-Flight Feeding Facility —there's no ketchup to mix with the jelly."

C.R. began to closely examine the contents of his box lunch, extolling the quality, or lack thereof, and nutritional value on an item-by-item basis. Sammy was busily reviewing his checklist for electrical system EPs. Max, with Section Three of the Dash One open, apprehensively waited for the reluctant Starlifter's next exhibition of electrical dissension. Meanwhile, in the cool quiet of the cargo compartment, TSgt. Ty Downs was about to heat up the oven and defrost the remains of a day-old meatball sub.

When Ty pushed in the oven CBs, the lights went out. Near total confusion engulfed the Able Aeronaut.

"Yeeooww! What in tarnation is going on?" demanded C.R.

"Boss, engineer. We've lost all our generators. I'm trying to get one back on line."

"Boss, copilot. Want me to hand fly the airplane, while you and Max run the emergency checklists?"

"Nonsense m'boy, the autopilot is doing just fine."

"Pilot, engineer. Put the Instrument Power switch to EMERGENCY, please. The switch is just above the ADI on your instrument panel."

As the Field Grade Fumbler leaned forward on the yoke to reach the switch, the snake-bitten lifter nosed earthward. In the cargo arena, Sergeant Downs found himself rising to the level of the cockpit door and grasping for a handhold, knowing that C.R. would soon regain aircraft control.

Good fortune was shining on our heroes as their dive and recovery went undetected by radar or nearby civilian aircraft. Sammy was able to level the aircraft despite C.R.'s weight being fully pressed against the yoke.

"Ahem, the Instrument Power Switch is now in EMERGENCY. Sergeant Torque, you may continue with the checklist.

"Sammy, fly the plane," directed C.R. "By the way, you'd better write up the radar; it seems to have quit."

"Boss, engineer again. I've got one generator back, and it connected to the buss. Before I put the second generator on line and get all the busses back, let's reduce the electrical load. We don't want to wind up losing power again . . ."

"Yes boss," interrupted Sammy, "we stand a better chance of getting all the busses back that we need. Since we're close to Prestwick, maybe we should divert there, rather than press on to Moldyhole."

"That idea has merit, Sammy. It gives us the opportunity to sample two fine products of fair Scotland—Scotch and smoked salmon. However, I'm more in need of a replacement for my XKE than Scotch—never acquired the taste for it.

"Faithful followers, we're pressing on for Moldyhole," said C.R., with a sweeping gesture of his short arm.

With that said, Sammy and Max continued cleaning up the remaining items on the "Loss of All Generators" checklist. When Max asked C.R. to return the Instrument Power Switch to normal, he implored him to avoid leaning on the yoke to reach the switch. The Able Aeronaut reluctantly slid his seat forward enough to comfortably reach the switch this time.

C.R. continued to expound upon the virtues of Scotish smoked salmon and the exorbitant prices exacted by gourmet shops for this epicurean delight. Sammy

kept busy checking headings and distances to suitable divert fields, between radio calls to Scottish Radar and trying to raise Moldyhole command post. By now the shorted-out Starlifter was in range of the punily powered command post radio.

"MAC 40176, command post, go ahead."

"Command post, 176," began Sam, "estimating blocks your station at four zero after the hour; Alpha Three for generators inop. Over."

"MAC 176, good copy on block time and status. Be advised an exercise launch in progress; expect a four five-minute delay for landing."

"What 45-minute delay?" asked C.R., before Sammy could reply to command post's last transmission. "This is a high priority mission, we've got a schedule to meet."

"MAC 176, according to our records you're already over 16 hours late. After landing call us back," came the curt response from Moldyhole.

The Addled Aviator began one of his usual tirades over interphone about the general lack of knowledge among command post duty types. Having already heard this harangue before, Sammy and Max turned down their interphone volume as much as possible. C.R. continued to run his mouth all the way to the DUCE holding pattern at which point he let Sam take over pilotage duty, mumbling something about "sharing heavy pilot responsibilities."

Sergeant Torque was keeping a weary eye on the two generators. Both seemed to be working fine, without a hint of past ailments. The volts and freqs were doing just great.

C.R. was doing just great too. He now whined about missing lunch and how he was going to miss his ride to look at a replacement for the ailing "Terrormobile." By this time Sammy was tired of running the radios, listening to C.R ramble on and staying in the holding pattern. He was about to ask the Boss to take over radio operator duties, then thought twice about allowing the Airways Airedale to communicate outside the aircraft. Instead, he asked him to take the next couple of turns around the pattern. Much to Long Sufferin' Sam's surprise, C.R. agreed. The Chief then began pointing out familar landmarks as he flew across the English countryside and out of the holding pattern.

Approach control caught the wayward airlifter and began issuing vectors for a straight-in ILS. To the amazement of the crew, C.R. called for the "Approach Check" with only minor prompting. Sergeant Torque paused several seconds after turning on the first of the two Number 3 Hydraulic System pumps. The generator loadmeters didn't even burp as the second pump was switched on.

In three minutes, the Starlifter bounced in for one of C.R.'s smoother landings. As the Lifter turned off the runway, an audible sigh of relief was heard coming from Sammy, Max, and Ty, thankful to be on terra firma finally.

"England at last!" exclaimed C.R. Before he could utter another word, Tower instructed them to contact command post.

"Command post, MAC 176, go ahead," called Sam.

"MAC 176, Phantom recut your mission. Keep your bags on the plane. You're going to Desolate AB, West Erg, crew rest, and upload an ALCE. By the way, it's field conditions."

The veins on the almost apoplectic C.R. began to bulge. Once again, the Master Manipulator's tunnel vision and preoccupation with searching for a car, had clouded his "common sense." Before he could key the mike, silence came to the flight deck once more as the generators tripped off-line. It was time to let maintenance fix the generators.

The hop to Desolate AB was off—the Jag safari was, once again, back on.

Caffeine Can Pick You Up . . . .

. . . Or let you down

By Melchol Antunano, M.D.
and
Stanley R. Mohler, M.D.

Caffeine is a natural ingredient of coffee beans, tea leaves, cola nuts, cocoa beans, and other plants. The primary source of caffeine in the Western Hemisphere is coffee. In the United States alone, yearly usage is nearly 2.4 billion pounds which yields 28.1 million pounds of caffeine. Cola-type soft drinks and tea also contribute significant amounts of caffeine.

Caffeine's great popularity can be attributed to its stimulating properties. Diminished fatigue, improved mood, and a temporary increase in physical and mental work capacity, all result from taking caffeine. The average American uses more than 200 mg each day (a cup of coffee contains about 100 mg). The average content per cup of selected caffeine-containing beverages is shown in Table 1.

Another source of caffeine is drugs. The content per tablet or capsule of several non-prescription "over-the-counter" drugs is shown in Table 2. In addition, many prescription drugs contain caffeine in combination with other chemical substances. A number of these drugs are used to relieve migraine headaches and pain, especially muscle and joint pain.

Physiological and Psychological Effects

Caffeine is an alkaloid which dissolves readily in hot water, is odorless, and has a bitter taste. The routine production of drinks containing caffeine does nothing to reduce its potency. Caffeine can be removed but to do so requires special processing.

Caffeine is rapidly absorbed when taken by mouth and reaches peak levels about one hour later. The average amount required to produce the level of stimulation many persons seek happens to match the average American's daily intake. Individuals who consume moderate quantities of caffeine (80-200 mg per day) often experience less drowsiness, less fatigue, and an increased capacity for muscular work. In addition, they often show an increased capacity for sustained intellectual effort, shorter visual reaction time, and improved auditory vigilance. Caffeine also helps repress tendency towards "response blocking," sometimes found when an individual is required to perform a monotonous task over an extended period of time.

Individuals suffering from a lack of sleep will show the greatest benefit from taking a limited amount of caffeine. However, even individuals who have had sufficient rest will have some reaction. An individual taking more than 150 to 250 mg in a single dose (equivalent to two cups of ground coffee or one Vivarin tablet) may suffer deterioration of performance on psychomotor tasks that require delicate muscular coordination and very accurate timing. This is because caffeine may produce a slight tremor due to its effects on the nervous system.

High Doses Cause Problems

The effects of consuming more than 300 mg of caffeine in a single dose, or in a short time period, resemble "anxiety-like" symptoms such as nervousness, restlessness, insomnia, mild involuntary trembling, and increased sensitivity to touch, pain, or other sensory stimulations. The effects on the cardiovascular system include an excessively rapid heartbeat and, for certain caffeine-sensitive individuals, irregularity of heart rhythm. High doses of caffeine can also produce a decrease of cerebral blood flow plus an increase in stomach acid secretions.

Regular Users Experience Side Effects

Continued use of large amounts of caffeine may result in restlessness, insomnia, tachycardia, and extra heartbeats. Instances of mood improvement and increases in performance experienced by caffeine users contribute to their desire for continued use despite the potential for adverse side effects. As with other drugs, caffeine can be habit forming when abused. Individuals addicted to caffeine can experience withdrawal symptoms and a certain degree of psychological dependence. Other caffeine-withdrawal symptoms include headache, fatigue, drowsiness, laziness, decreased vigor, irritability, and

Table 1
Caffeine Content per Cup of Various Popular Beverages

Roasted or ground coffee	85-110 mg
Instant coffee	60 mg
Decaffeinated coffee	3 mg
Brewed tea	50 mg
Instant tea	30 mg
Cocoa or chocolate	5 mg
12 oz cola drink	50 mg

Table 2
Caffeine Content per Tablet or Capsule of Various Non-Prescription Drugs

Cold and Allergy Relief Drugs	
Alpha-Phed	32 mg
Sinarest	30 mg
Tussirex	25 mg
Dristan	16 mg
Headache Relief Drugs	
Excedrin	65 mg
Anacin	32 mg
Vanquish	33 mg
Stay-Awake Drugs	
Vivarin	200 mg
Efed II	200 mg
No Doz	100 mg
Appetite Control Drugs	
Dexatrim	200 mg
Codexin	200 mg
Prolamine	140 mg

decreased alertness. Withdrawal symptoms usually peak one or two days after interruption and diminish progressively over the next five or six days. Should one become addicted to caffeine, a gradual reduction of the daily intake will minimize withdrawal symptoms.

Caffeine and Alcohol Don't Mix

Caffeine does not counteract the depressant effects of alcohol. Studies have shown the adverse effects of alcohol may be increased by caffeine. The cognitive, perceptual, and motor functions required to complete complex tasks can be further impaired by the combined effects of alcohol and caffeine. Performance is also adversely affected during the hangover phase when individuals drink more coffee in an attempt to escape their misery.

Cigarettes and Caffeine Diminish Performance

Nicotine is another commonly used drug with specific stimulant and toxic properties. It produces vasoconstriction, increased heart rate, and elevated blood pressure. Burning tobacco releases carbon monoxide which produces hypoxia in the smoker. Regular use of nicotine decreases caffeine's metabolic half-life, so caffeine remains active for about three hours in smokers compared to four-and-a-half to seven hours in nonsmokers. This results in increased caffeine intake as individuals attempt to maintain the desired effects.

Pilot Performance Reduced

Caffeine consumption is a potential operational and medical problem since many people consume enough caffeine to cause detrimental effects. This problem is especially important for people with occupations involving the operation of complicated equipment. It is also significant whenever a person's sensory integrity (vision, hearing, touch) and adequate cognitive and psychomotor performance are required to operate at a high level. Pilots deserve special attention because of the complexity, accuracy, and precision required to fly an aircraft. Consumption of high amounts of caffeine (more than 300 mg a day) can result in deterioration of psychomotor performance and cause changes in mood which can impair a pilot.

Consume Caffeine Carefully

Someone wishing to take advantage of the mild stimulant properties of caffeine without encountering adverse reactions should limit his caffeine consumption to a maximum of 300 mg per day or 200 mg in a single dose. Caffeine should not be considered a countermeasure against the depressant effects of alcohol. It is a potential drug of abuse, and individuals who have used large amounts can experience unpleasant withdrawal symptoms when intake is interrupted.

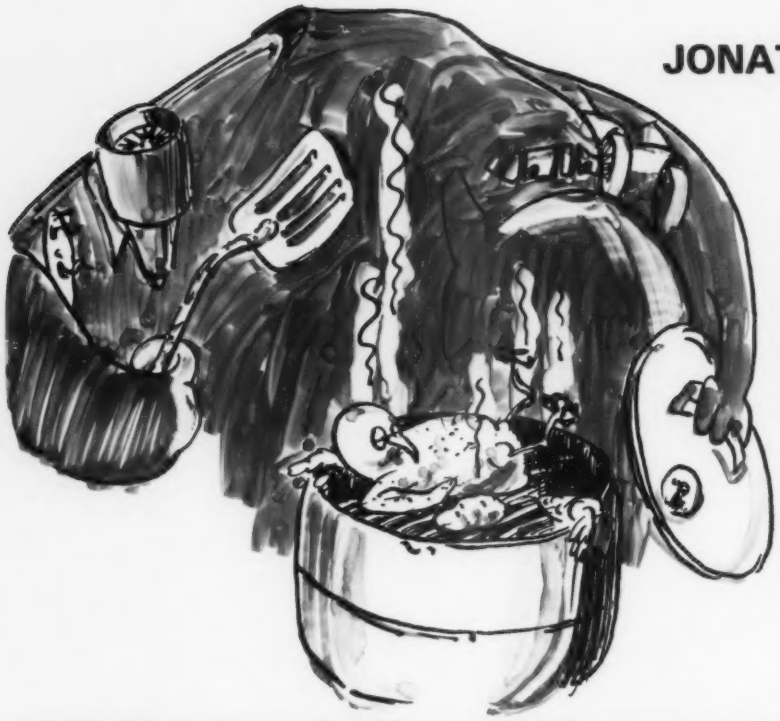
Adapted From *Flight Safety Foundation*

"WILDLIFE CAPERS"

This unfortunate crew has the dubious distinction of "doing in" Bambi's cousin, along with its fawn, at an airport in the northeastern region of the U.S. During touchdown, the crew felt a small thump in addition to the landing impact, but didn't realize anything unusual had happened. Later, heavy damage to the right inboard gear door, and a medium-sized hole, were discovered in their C-130. A check of the airfield revealed they had run into, or over, a doe and fawn that had chosen a untimely moment to cross the runway.

What probably prevented the crew from noticing them in time to take evasive measures, was the fact the landing light on the side they were coming from was inop. There being no provisions in state fish and game laws for hunting deer with a multi-engine turboprop aircraft, no action was taken against the crew. A class action suit on behalf of helpless furry animals everywhere, however, was filed by attorneys for the Animal Rights Society.

QUICKSTOPPERS



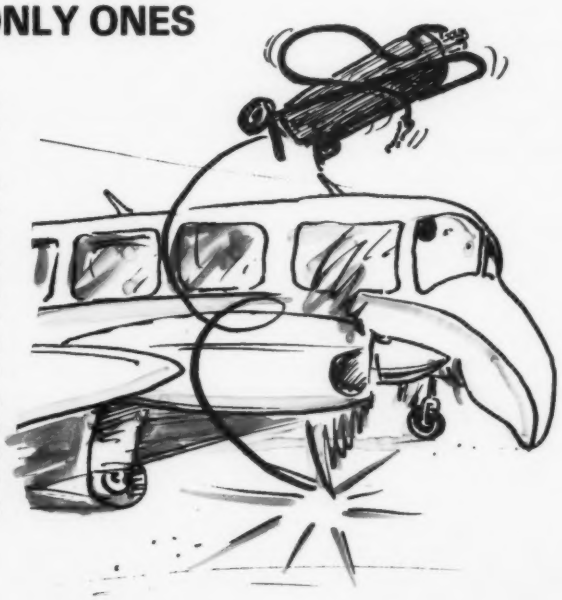
JONATHAN LIVINGSTON

Immediately after takeoff, a C-5 passed through a small flock of sea gulls. Several of the birds participated in a kamikaze attack on the Galaxy, achieving limited success. Shortly after "bird impact," the crew noticed a burning smell followed by vibrations from the Number 1 engine which had been forced into service as a cooktop grill. The "Emergency Engine Shutdown" checklist was completed and the crew returned to base, landing uneventfully. At least one bird had found its way into the engine, causing over $190,000 in damage. The engine was removed and Jenn-Air contacted for possible replacements.

WE'RE NOT THE ONLY ONES

After landing at a U.K. airport, the pilot of a Piper PA-31 gave ground handling personnel his departure in Zulu instead of local time.

As could be expected, there were no marshallers on hand when the pilot was ready for departure. During preflight, he'd noticed a fire bottle close to the right side of the aircraft but didn't consider it a hazard. After boarding the passengers, the pilot called for engine start hoping this would result in the dispatch of ground personnel—to no avail. Marshallers were still not present when he was ready to taxi, so he got underway without assistance. He began a right turn and the propeller struck the fire bottle which was not visible from the pilot's seat. There were no injuries although the aircraft sustained substantial damage to the right propeller and tail. Yet another case of fire bottles attacking aircraft.



Adapted From *Flight Safety Digest.*

After Deadlines

MAXIMUM SUNSPOT ACTIVITY--March marked the beginning of the multi-year maximum in sunspot activity. Solar activity is expected to interrupt VLF, HF, and VHF communications for 3-4 years. Solar flares or related solar/geophysical activity can degrade radio and satellite communications. This will impact MAC crews as follows:

--Aircraft HF radios operating in the 3-30MHz band "bounce" off signals off the ionosphere to communicate over long distances. During solar flares, the sunlit ionosphere is bombarded by bursts of x-ray energy causing HF radio fades lasting up to two hours.

--Polar cap absorption (PCA) will affect aircraft flying above 65 degrees North latitude or those dependent on polor path VLF/Omega navigation signals. When major flares occur, they sometimes eject high energy protons and other charged particles toward Earth. These particles smash into the lower ionosphere, ionizing neutral molecules. The increased ionization then causes HF and VHF radio signals to be absorbed. During PCA events radio communications are usually limited to line-of-sight.

(AWS Operations Digest, Jan-Fen 90).

"KEYS, WHEELS, MEALS" PROGRAM TESTING--Two Military Airlift Command bases are among 11 in the Air Force testing Project PRIME KNIGHT, a new program providing "keys, wheels, and ready-access meals" to visiting aircrews upon arrival. Travis AFB, Calif., and Rhein-Main AB, Germany, began testing 1 March. The test period ends 30 September. If the project is successful, officials predict PRIME KNIGHT will be implemented Air Force wide, by 1 October 1990. PRIME KNIGHT managers at Travis and Rhein-Main ensure crews are met planeside, given room keys, transportation, and ready-access to meals. Aircraft commanders are responsible for making reservations at the host billeting office or with the program manager one day in advance. Other test bases are Ramstein AB, Germany; RAF Mildenhall, United Kingdom; Hickam AFB, Hawaii; Kadena AB, Japan; Elmendorf AFB, Alaska; Offutt AFB, Neb; Kelly AFB, Texas; Nellis AFB, Nev; and Keesler AFB, Miss.

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Out of the Past

Boeing C-97 Stratofreighter